PROJECT NUMBER: 1307
PROJECT TITLE: Reconstituted Tobacco Development
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PERIOD COVERED: January, 1989

I. IMPROVED SHEET PROPERTIES

A. Objective: Improve the physical characteristics and blend properties of reconstituted sheet materials.

B. Results:

1. ART Project - POL results evaluating the acceptability of utilizing half of the ART stems in RL showed a preference for the control (pilot RL in both the test and control cigarettes). A second set of pilot RL sheets made with current ART stems (PG/glycerine precasing on the extracted filler) were subjectively quite comparable to the POL test sheets in blends, and represented no improvement. Full ART stem utilization pilot sheets made from both of these ART stem lots were also very similar in blends; these were more subjectively detectable than the half utilization sheets, but less so than would be expected from doubling the ART stem.

   The second lot of stems (precased ART filler) was also used to make pilot RL utilizing a quarter and an eighth of the ART stems. These will be screened in the normal TC/150B combination. Blends will also be made with individual sheets of the various utilization levels (e.g., test TC with control 150B) in order to determine if ART stem inclusion in a particular RL type is more subjectively feasible.

   RCB handsheets will also be made at lower ART stem inclusion levels (half utilization was subjectively obvious in handmade 100% cigarettes). Additional handsheets will be made using postwashed ART stems, simulating washing of the ART stems along with (or in lieu of) the burley stems at the BL Plant.

2. Humectants - Blends made with PG/glycerine-free strip casings were found unacceptable (dry, metallic), attributed to excess sugars in the strip casings (sugars used to replace PG and glycerine). The casings are being reformulated for retesting. Cigarettes were made of production PG/glycerine-free sheet materials (24% blend level) and expanded blend components (100% cigarettes) for subjective screening.

C. Plans:

1. Expedite cigarettes with low ART stem levels in RL, and test/control RL combinations.

2. Evaluate lower ART stem levels in RCB.

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3. Produce sheets from ART stems with Hauni tunnel treatment, and sheets from top and bottom absorber baskets.

4. Expedite evaluation of PG/G-free blend components and casings.

II. SUBJECTIVE MODIFICATION OF RL

A. **Objective:** Improve or modify the subjective character of RL.

B. **Results:**

1. Modified 150B - Results from RL pilot trials showed that the Branson ultrasound unit was unsuccessful in eliminating phosphate precipitate rejection from Modified 150B size at the size press nip. No further pilot work on Modified 150B is planned; pursuit of RCB subjective flavor in RL will require the creation of a new flavor system.

2. Dry Flavor Replacement - Initial large analytical differences in liquid flavor samples from the three potential vendors necessitated an iterative process wherein Flavor Development analyzed samples of native extracts (as extracted, without sugar or color adjustment) and recommended changes in roasting conditions, resulting in new samples for analysis. The latest samples from Madis and Takasago are analytically close to each other and reasonably close to the Chart "control" sample. These have passed initial screening (sprayed on unflavored RL) and larger quantities for pilot trials are enroute.

C. **Plans:**

1. Produce pilot RL-150B with individual liquid flavor samples.

III. PAPERMAKING TECHNOLOGY

A. **Objective:** Support development of proprietary cigarette papers for low sidestream and other new product applications.

B. **Results:**

1. Handsheets - The new Coresta porosity unit was installed in the handsheet lab and calibrated. Handsheets were made at a range of porosities to evaluate fillers (dolomite, magnesium carbonate, calcium carbonates of various and mixed micron sizes). Unfilled papers were made and sized with various burn rate additives and a burn rate retardant. Evaluation of sol-gel coating techniques was initiated.

   Plots of porosity vs. airflow through papers (handsheets, Maine pilot papers and commercial papers) gave a straight line relationship indicative of air flow through pores. Plots for perforated or holed papers are nonlinear, indicative of orifice flow.

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Handsheet work concentrated on simulation of Trim-5 double wrap papers prior to pilot trials at the University of Maine. These included the inside paper (18 gm, 3% carbonate), the outside paper (45 gm, 35% carbonate), a single 63 gm composite paper with prorated carbonate content (26%), and a bilayer paper made by wet pressing the 18 and 45 gm papers at couching moisture (~85% OV).

2. Pilot Trials - The above bilayer paper was produced on the Maine pilot machine by employing the secondary headbox. In commercial manufacture, this paper would be made using a second Fourdrinier wire and laminating the two sheets at couch moisture; this would better maintain the filler integrity of the individual layers and would allow separate recovery of the two white waters. Maine is also producing the corresponding composite paper,a comparable bilayer paper using wood pulp in the 45 gm layer, and a calcium carbonate/magnesium carbonate bilayer paper.

   Maine will also produce a control paper duplicating standard commercial paper for a subjective comparison test (qualification of Maine pilot papers). Maine installed the new vacuum pickup device, which has improved runnability. A second small stock screen for the secondary headbox is no longer commercially available; Maine has received construction drawings and permission to duplicate the existing pilot screen from the vendor. Maine will also try to groove an existing press roll with vergeure lines. The physical properties of European cigarette papers containing wood pulps were reviewed, and Maine was provided samples of three domestic commercial cigarette papers for physical evaluation.

   A gate roll type coater was identified as the best means of applying sizing agents, including sol-gels, with a range of viscosities. Maine will conduct preliminary trials using their new gate roll coater to determine feasibility.

C. **Plans:**

1. Complete Maine production of simulated double wrap papers (bilayer and composite) each at three porosities, bilayer paper with wood pulp, and bilayer Ca/Mg carbonate paper.

2. Duplicate PM commercial cigarette paper at Maine for subjective qualification of Maine pilot papers.

3. Develop rapid drying capability for the Product Development coater to prevent size migration between paper layers.

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